

The successful real-world application of the project's outcomes could also enable the promotion of a culture of adherence within the community.

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Identifying the potential inappropriate prescriptions in community-dwelling older patients by using GheOP³S tool

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Background: Older adults tend to have more than one chronic disease and polypharmacy, which can be resulted in inappropriate prescriptions.

Purpose: The objective was to identify potential inappropriate prescriptions through a medication review for community-dwelling older adults.

Methods: This study was conducted prospectively in community pharmacies between 1 February and 30 June 2024. The study included patients who came to the community pharmacy for any reason, used at least one medication regularly, were over 65 years of age, and provided consent. The medication review was performed using the Ghent Older People's Prescriptions Community Pharmacy Screening (GheOP³S version 2) tool (1). The GheOP³S tool consists of 5 sections (potentially inappropriate medication, potentially inappropriate medication dependent on comorbidities, potentially omitted medication, drug-drug interactions especially relevant in older people, pharmaceutical care-related criteria to be addressed in the community pharmacy) and 64 criteria, in total.

Findings: The study included 100 patients, 55% of whom were female. The mean age of the patients were 70.6 (\pm 4.9) years. The most prevalent chronic diseases were hypertension (n=55), type 2 diabetes mellitus (n=43) and hypercholesterolemia (n=32). Polypharmacy (use of five or more medications) was identified in 64% of patients, with a mean of 5.2 (\pm 2.2) medications per patient. A total of 345 issues could be resulted in potential inappropriate prescriptions were detected in 89 patients. It was found that 76 (22%) of these issues were caused by potential inappropriate medication use, 76 (22%) by potentially omitted medication and 70 (20%) by drug-drug interaction. The remaining 123 (36%) were from the category of pharmaceutical care-related criteria to be addressed in the community pharmacy. Regardless of the categories, the most prevalent issue across all GheOP³S criteria was the use of vasodilator drugs (n=48). The other common issues were the lack of annual influenza vaccination (n=38), and the use of combination of medications that increase the risk of falls (n=37).

Conclusion: In this study, the frequency of polypharmacy and potentially inappropriate prescribing was found to be high in community dwelling older patients. The community pharmacist-led interventions could be used to prevent, identify, and solve potential inappropriate prescribing in older adults.

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Shaping tomorrow's pharmacists: A scoping review on future skills and educational strategies

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Background: According to the WHO [1], global challenges in healthcare systems require a redefinition of health care teams, a broader perspective on competencies as well as an expansion of the professional roles of pharmacists [2]. Whilst clinical competencies remain crucial, recent societal and technological developments, including AI, underscore the importance of transversal

competencies –alternatively determined as future or 21st century skills [3,4]. A variety of future skills frameworks exist that originate, for instance, from a labor market (e.g. Future of Jobs Report, World Economic Forum [5]) or education policy perspective (e.g. OECD Learning Compass [6]) including problem-solving competence to deal with new challenges in healthcare or collaboration competence to work in increasingly interdisciplinary teams. Beyond, self-directed learning competence is essential to adapt to changing work requirements and take on new roles. Future skills research indicates that acquisition and development of future competencies require modern teaching techniques.

To date, no future skills approach has been developed specifically for pharmacists, but studies identifying the most important future skills for pharmacists are available as well as studies that emphasize the role of curricula development and modern teaching techniques in undergraduate pharmacy education.

Purpose: We aim to synthesize the existing literature on future competencies that pharmacists will need to maintain and efficiently expand their professional roles in healthcare. Additionally, we will explore initiatives on educational curriculum development and associated teaching methods suitable for pharmacists.

Methods: A scoping review will summarize data of two literature reviews: (1) to identify the most relevant competencies required for pharmacists for new roles and responsibilities in healthcare. The competencies will include future skills typically included in future skills frameworks and exclude professional competencies related to clinical and pharmacological knowledge. (2) to review existing initiatives in undergraduate pharmacy curricula aimed at enhancing these competencies. The scoping review will be conducted in relevant databases (PubMed, Scopus, ERIC, WoS) and in pharmaceutical journals (members of the Granada statement).

Findings: During the preliminary search, for instance the following competencies were identified: leadership, problem solving, design thinking, (digital and intercultural) communication, (interdisciplinary) collaboration, self-directed learning or data literacy.

The scoping review will be conducted in December 2024-January 2025

Conclusion: This scoping review provides an overview of future competencies beyond professional skills required for pharmacists to adopt new roles in healthcare. Approaches for curriculum development and teaching methods in pharmacy with regard to single or a broader set of future skills will be summarised.

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A global outlook of pharmacist independent prescribing in community pharmacy: A scoping review

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Background: Pharmacist prescribing has expanded in recent years, with independent prescribing gaining notoriety. Pharmacist independent prescribing services are being implemented as a strategy to alleviate the increasing pressure on overstretched health systems worldwide. Two models are identified: standard of care prescribing, where pharmacists can prescribe for any condition within their competence, and government protocols prescribing, limiting prescribing to specific conditions and medications outlined in official protocols. Considering the heterogeneity across countries, it is crucial to explore and understand the diverse models to inform future policies and practices.

Purpose: To identify countries and territories where pharmacists prescribe independently in community pharmacy and summarise their prescribing models.

Method: Literature on prescriptive authority of pharmacist independent prescribers was included. And literature describing dependent prescribing models, non-community pharmacy settings, opinions, economic or clinical outcomes on pharmacists prescribing was excluded. Five databases were used for the search: Scopus, Web of Science, CINAHL, PubMed, and Cochrane, along with the Google search engine for grey literature.

Findings: The following countries were identified: United Kingdom, Canada, United States, Australia, Poland, Switzerland, Denmark, and France. In the

United Kingdom, pharmacist independent prescribers can prescribe any drugs within their competence. Pharmacists can also supply prescription-only drugs using Patient Group Directions for specific conditions. In **Canada**, the province of Alberta has the broadest scope, as pharmacists with additional authorization may pre- scribe autonomously any prescription-only drug. The rest of the provinces permit prescribing for defined conditions. Manitoba is the only province not allowing prescribing for prescription-only drugs. In the United States: In **Idaho**, **Montana**, and **Colorado** pharmacists can autonomously prescribe for self-limiting and minor conditions, and already diagnosed conditions. It also has State- specific protocols allowing pharmacists to prescribe for certain conditions (e.g., California, Oregon). **Australia**: Five states have limited prescribing for urinary tract infections and contraception renewals, with pilot programs for expanded authority in some regions. **Poland** allows autonomous prescribing for the pharmacist himself (pro-auctore) and family members and members in cohabitation (pro-familiale). **Switzerland** has a set of conditions pharmacists can prescribe for including drugs reclassified as prescription-only drugs. In **Denmark** pharmacists can renew prescriptions for certain conditions. In **France** pharmacists can initiate prescriptions for urinary tract infections and bacterial tonsillitis. **Conclusion**: United Kingdom, Canada (Alberta), United States (Colorado, Montana, Idaho), and Poland (pro-auctore and pro-familiale) have the standard of care model. Government protocols are used in the rest of Canada, United States, Australia, Switzerland, Denmark, and France.

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Developing Outcome-Based Performance Indicators for Professional Pharmacy Services: A Mixed-Methods Approach

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Background: Professional pharmacy services' outcomes performance measurement has relied on output-based indicators rather than on outcomes.(1) While these metrics are easier to measure and track, they do not directly capture the impact of these services on patient health outcomes. This gap has been noted in the literature, emphasizing the need for a shift towards health outcome-based indicators that more accurately reflect the value and effectiveness of professional pharmacy services. **Purpose**: To define relevant health outcomes and performance indicators to assess professional pharmacy services, through a Design Science (DSRM) approach.

Study design: A mixed-methods study design will explore and validate health outcomes and indicators that best suit professional services provided in Portuguese pharmacies. This will be done through semi-structured interviews with pharmacy owners and professional service managers, guided by the Consolidated Framework for Implementation Research 2.0 CFIR).(2) The quantitative component complements this by employing a self-administered questionnaire based on the CFIR 14-Item pCAT model.(3) This method ensures that the defined performance indicators are grounded in real- world practice and perspectives.

Findings: Targeting active community pharmacists, constructs such as acceptability, feasibility, and impact, which are critical for determining the practical applicability of the identified indicators, will be assessed. The CFIR framework enables a systematic exploration of key constructs that influence the design and implementation processes, facilitating the identification of health outcome indicators, the services they pertain to, and the characteristics, necessity, and advantages of a performance dashboard.

Conclusion: The transition from output-based to health outcome-based performance indicators in professional pharmacy services is crucial for accurately evaluating their impact on patient health. Leveraging the Consolidated Framework for Implementation Research (CFIR) ensures the creation of a user-centred solution grounded in real-world insights. This approach not only bridges existing gaps but also tailors the solution to the needs and challenges of pharmacists, ultimately enhancing the effectiveness of pharmacy service evaluation.

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Evaluating Large Language Models in Self-Care: Accuracy of Medicine and Supplement Guidance for Patients

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Background: Recent developments in artificial intelligence, particularly large language models, are exerting a profound influence on the medical and pharmaceutical sciences. These tools, once limited to specialized uses in diagnostics and data discovery, are now easily accessible to the general public.

Purpose: This study aimed to critically evaluate the performance of large language models in answering patients' self-care questions about medications and supplements.

Method: A comprehensive analysis was conducted to evaluate the performance of six leading language models across four key dimensions: correctness, language independence, context sensitivity, and reproducibility. This evaluation was facilitated by a newly developed reference set of questions and a scoring matrix.

Findings: The large language models investigated were generally capable of accurately answering most self-care questions and providing relevant health information. However, there was substantial variability in the responses, including potentially unsafe advice, influenced by language, question structure, user context, and time. GPT-4.0 scored the highest on average, while GPT-3.5, Gemini, and Gemini Advanced had varied scores. Responses were sensitive to context and language. In a 60- day experiment involving repeated queries, Perplexity exhibited the greatest variability in response generation, indicating the lowest level of temporal consistency.

Conclusion: The high-quality outputs generated by large language models indicate their potential utility in future self-care applications. The newly created benchmark can facilitate further validation and guide the establishment of strict safeguards to mitigate the significant risk of misinformation. Prioritizing patient safety necessitates the establishment of stringent safeguards to mitigate potential risks and optimize the benefits derived from this innovative technology.

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First results of a randomized controlled trial evaluating an app- based adherence pharmacy service for ambulatory patients with short-term antibiotic therapy (Re SMAPP Study)

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Background: Antibiotics are among the most crucial medicines of our modern age. In Switzerland in 2022, 26% of all prescriptions included co-amoxicillin making it the most widely prescribed antibiotic in the outpatient setting. Forgetfulness is one major challenge to adherence in antibiotic therapy, often resulting in recurring infections and increasing antibiotic resistances. Therefore, re- minding patients to take their antibiotic and educating them about the importance of their intake behavior is a promising approach to improve medication adherence.

Purpose: To evaluate the effectiveness of a two-level intervention using an app-based reminder system and motivational/educational text messaging to improve adherence to short-term antibiotic therapy with co-amoxicillin.

Methods: This monocentric, cluster-randomized, double-blind, two-arm study is